

FORM PTO-1390
(REV 12-29-99)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

1314

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/554132

INTERNATIONAL APPLICATION NO.
PCT/SE98/00842INTERNATIONAL FILING DATE
7 May 1998 (07.05.98)PRIORITY DATE CLAIMED
10 November 1997 (10.11.97)

TITLE OF INVENTION A Method and Arrangement for Wireless Data Transmission

APPLICANT(S) FOR DO/EO/US Gunnar WAHLSTEN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
 - International Search Report
 - International Preliminary Examination Report
 - Verified Statement Claiming Small Entity Status

Express Mail Label No.: EK167523832US

U.S. APPLICATION NO. (if no. on serial 37 CFR 1.101) 09/354132		INTERNATIONAL APPLICATION NO. PCT/SE98/00842		ATTORNEY'S DOCKET NUMBER 1314	
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17. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) : Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$970.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$840.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$690.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$670.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$96.00 <div style="text-align: right;">ENTER APPROPRIATE BASIC FEE AMOUNT =</div>	CALCULATIONS PTO USE ONLY																										
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	<div style="text-align: right;">\$ 970</div> <div style="text-align: right;">\$</div>																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:15%;">CLAIMS</th> <th style="width:20%;">NUMBER FILED</th> <th style="width:20%;">NUMBER EXTRA</th> <th style="width:20%;">RATE</th> <th style="width:25%;"></th> </tr> <tr> <td>Total claims</td> <td>8 - 20 =</td> <td>0</td> <td>X \$18.00</td> <td>\$ 0</td> </tr> <tr> <td>Independent claims</td> <td>2 - 3 =</td> <td>0</td> <td>X \$78.00</td> <td>\$ 0</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$260.00</td> <td>\$ 0</td> </tr> <tr> <td colspan="4" style="text-align: right;">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$ 970</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		Total claims	8 - 20 =	0	X \$18.00	\$ 0	Independent claims	2 - 3 =	0	X \$78.00	\$ 0	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00	\$ 0	TOTAL OF ABOVE CALCULATIONS =				\$ 970	<div style="text-align: right;">\$ 0</div> <div style="text-align: right;">\$ 0</div> <div style="text-align: right;">\$ 0</div> <div style="text-align: right;">\$ 970</div>	
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Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).	<div style="text-align: right;">\$ 485</div>																										
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Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	<div style="text-align: right;">\$</div>																										
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Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property	<div style="text-align: right;">\$ 40</div>																										
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a. ☐ A check in the amount of \$_____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. 501300 in the amount of \$ 525.00 to cover the above fees.
 A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional ^{filing} fees which may be required, or credit any
 overpayment to Deposit Account No. 501300. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO: Alfred J. Mangels 4729 Cornell Road Cincinnati, OH 45241-2433	<div style="text-align: center;"> SIGNATURE: Alfred J. Mangels </div> <div style="text-align: center;"> NAME 22,605 </div> <div style="text-align: center;"> REGISTRATION NUMBER </div>
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Applicant or Patentee: Gunnar Wahlsten Attorney's 1314
Serial or Patent No.: _____ Docket No.: _____
Filed or Issued: _____
Title: A method and arrangement for wireless data transmission

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(d) & 1.27(e))--SMALL BUSINESS CONCERN

I hereby declare that I am

- ☒ the owner of the small business concern identified below:
☐ an official of the small business concern empowered to act on behalf of the concern identified below:
NAME OF SMALL BUSINESS CONCERN Dobora Communication AB
ADDRESS OF SMALL BUSINESS CONCERN P.O. Box 152, SE-132 25
Saltsjö-Boo, Sweden

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled A method and arrangement for wireless data transmission by inventor(s) _____ described in _____

- ☒ the specification filed herewith
☐ application serial no. _____ filed _____
☐ patent no. _____ issued _____

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention is listed below* and no rights to the invention are held by any person other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e). *NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME _____
ADDRESS _____
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION
NAME _____
ADDRESS _____
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Jörn Danberg
TITLE OF PERSON IF OTHER THAN OWNER _____
ADDRESS OF PERSON SIGNING KUMHÄLSVÄGEN 7, 13132 Saltsjö-Boo
TH 04678-7428960
SIGNATURE [Signature] DATE 2000-05-03

**PATENT COOPERATION TREATY
IN THE UNITED STATES ELECTED OFFICE (EO/US)**

In re application of:]	
]	
Gunnar WAHLSTEN]	
]	
Int'l. Appl'n. No.: PCT/SE98/00842]	
]	PCT DO/EO Section
Int'l. Filing Date: 7 May 1998]	
]	
Priority Date: 10 November 1997]	
]	
For: A METHOD AND ARRANGEMENT FOR]	
WIRELESS DATA TRANSMISSION]	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Prior to examination, and before the calculation of the national filing fee, please
amend the above-identified international application as follows:

IN THE SPECIFICATION:

Page 1, line 2, insert --BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION--;

line 7, insert --DESCRIPTION OF THE RELATED ART--;

line 27, delete "programmes" and inserts therefor --programs--.

Page 2, line 14, delete "shall be" and insert therefor --are--;

line 19,delete "shall be" and insert therefor --are--;

line 26,delete "programmes" and insert therefor --programs--.

Page 3,line 15,insert --SUMMARY OF THE INVENTION--;

line 22,delete "shall".

Page 4,line 21,delete "shall be" and insert therefor --is--;

line 27,delete ", wherein the " and insert therefor --. The--;

line 28,delete ", wherein" and insert therefor --and--;

bridging lines 30 and 31, delete ", and wherein the is characterized in the
information" and insert therefor --. Information is--;

line 32,after "computer" insert --and--.

Page 5,line 2, delete ", in that" and insert therefor --. The--;

line 5, delete "in that" and insert therefor --and the--;

line 8, delete ", in that the two" and insert therefor --. Two--;

line 9, delete "in that";

bridging lines 13 and 14, delete "an arrangement that has the main features defined
in claim 5" and insert therefor --apparatus for carrying out the method--;

line 15,insert --BRIEF DESCRIPTION OF THE DRAWING--;

line 21,insert --DESCRIPTION OF THE PREFERRED EMBODIMENTS--.

Page 9, line 21, delete "comprise" and insert therefor --be in the form of--.

Page 11, line 1, delete "CLAIMS" and insert therefor --What is claimed is:--.

IN THE CLAIMS:

Kindly amend the claims as follows:

1. (Amended) A method for the wireless transmission of data between one computer and at least one [or more] other [computers] computer with the aid of [the DAB] a digital transmission system [or a corresponding system] for the wireless transmission of digital data, where [the] a transmitting computer is connected to a [DAB] digital transmitter and where [the] a receiving computer [or computers is/are] is connected to a respective [DAB] digital receiver, [characterized in that information that is outputted intermittently from the transmitting computer (1) is stored intermediately] said method comprising the steps of: storing information to be transmitted from the transmitting computer to the receiving computer in a first memory [(8) of] associated with a first adaptation circuit [(7)] disposed between the transmitting computer [(1)] and the [DAB] digital transmitter [(3); in that information is outputted essentially] ; substantially continuously outputting information from said first memory [(8)] to said [DAB] digital transmitter [(3)] under the control of an outfeed oscillator [(9)] in the first adaptation circuit; [in that transmitted] transmitting digital information [is received by a DAB] from the digital transmitter to a digital receiver [(4) and fed] operatively coupled with the receiving computer; feeding the digitally transmitted information from the digital receiver into a second memory [(12) in] associated with a second adaptation circuit [(11)] disposed between the digital

receiver and the receiving computer and that is under the control of an infeed oscillator [(13)] in the second adaptation circuit [(11); in that] ; storing the digitally transmitted information in the second memory; operating the two oscillators [(9, 13) operate on mutually] at substantially the same frequency [or essentially the same frequency; and in that the receiving computer (2) is caused to fetch information] ; and conveying intermittently from the second memory [(12)] in the second adaptation circuit [(11)] to the receiving computer nformation that has been stored in the second memory.

2. (Amended) A method according to Claim 1, [characterized in that] including the step of synchronizing the frequency of the infeed oscillator [(13)] in the second adaptation circuit [(11) is caused to be synchronized] with the frequency of the outfeed oscillator [(9)] in the first adaptation circuit [(7),] by locking the frequency of the [second] infeed oscillator [(13)] onto a reference included in the [received] digitally transmitted signal from the digital rtransmitter.

3. (Amended) A method according to Claim 1 [or 2, characterized in that] , including the steps of providing in the second adaptation circuit [(11) includes] a microprocessor [(15) which is caused to determine] for determining from a fast information channel (FIC) in the [DAB] digital system those parts of the [received] digitally transmitted signal that contain data, and [to cause] storing the [received] digitally transmitted data [to be stored] in the second memory [(12) of the second adaptation circuit (11)].

4. (Amended) A method according to Claim 3, [characterized in that] including

the step of identifying in the microprocessor [(15)] of the second adaptation circuit [(11)] is caused to identify] information that is relevant to a receiving computer [(2)] and that includes identification of address information [and possibly also authorization].

5. (Amended) An arrangement for the wireless transmission of data between a first computer and at least one [or more] other [computers] computer with the aid of [the DAB system or some corresponding] a digital transmission system for the wireless digital transmission of data, [where the] said arrangement comprising: a transmitting computer [is] connected to a [DAB] digital transmitter [and where the] ; a receiving computer [or computers is/are] connected to a [respective DAB] digital receiver [, characterized by] ; a first adaptation circuit [(7)] disposed between [a] the transmitting computer [(1)] and the [DAB] digital transmitter [(3)], said first adaptation circuit [being] adapted to store information delivered intermittently from the transmitting computer [(1)] intermediately] in a first memory [(8)] that belongs to] associated with said first adaptation circuit [(7); in that] , wherein the first adaptation circuit [(7)] is adapted to output] outputs the information from said first memory [(8)] to said [DAB] digital transmitter [(3)] [essentially] substantially continuously [under the control of] ; an outfeed oscillator [(9)] disposed in the first adaptation circuit [(7)]; [in that the arrangement includes] a second adaptation circuit [(11)] disposed between [DAB] the digital receiver [(4)] and the receiving computer [(2)] respectively, said second adaptation circuit (11) being adapted to input information received by the DAB receiver (4) into] ; a second memory [(12)] disposed in the second adaptation circuit [(11)] under the control of] , wherein said second adaptation circuit inputs information received by the digital receiver into the second memory; an infeed oscillator [(13)]

disposed in said second adaptation circuit [(11); in that] for controlling the transmission of information from the second memory to the receiving computer, wherein the [two] outfeed and infeed oscillators [(9, 13)] operate at [the same or essentially] substantially the same frequency; and [in that] wherein the receiving computer [(2) is adapted to] can fetch information intermittently from the second memory [(12) in the second adaptation circuit (11)].

6. (Amended) An arrangement according to Claim 5, [characterized in that] wherein the frequency of the infeed oscillator [(13)] in the second adaptation circuit [(11) is intended to be] is synchronized with the frequency of the outfeed oscillator [(9)] in the first adaptation circuit [(7),] by locking the frequency of the [second] infeed oscillator [(13)] to a reference signal included in the [received] transmitted signal.

7. (Amended) An arrangement according to Claim 5 [or 6, characterized in that] , wherein the second adaptation circuit [(11)] includes a microprocessor [(15) which is adapted to decide] for determining from a fast information channel (FIC) in the [DAB] digital system which parts of the [received] transmitted signal contain data, and to store [received] transmitted data in the second memory [(12) of the second adaptation circuit (11)].

8. (Amended) An arrangement according to Claim 7, [characterized in that] wherein the microprocessor [(15)] in the second adaptation circuit [(11) is adapted to identify] identifies transmitted information that is relevant to the receiving computer [(2)] and that includes identification of address information [and possibly also authorization].

REMARKS

The foregoing specification amendments add the preferred subheadings at appropriate places within the specification, and they also incorporate several minor corrections and clarifying amendments. None of the amendments introduces new matter because each is based upon the international application as filed.

The claims as above amended present the claimed subject matter in the U.S. claim form to more particularly point out and more distinctly claim the subject matter that the applicant regards as his invention. Additionally, the claim amendments delete multiple claim dependency.

Attached hereto is an Abstract of the Disclosure presented on a separate sheet in conformity with the rules of practice.

Based upon the foregoing specification and claim amendments to this national phase application, it is believed that the application conforms with U.S. formal requirements. Additionally, because the amended claims as hereinabove presented conform in substance with the corresponding claims that were examined in the international application, and based upon the acceptance by the International Preliminary Examining Authority of the invention as it was claimed in the claims that were filed in the international application as meeting each of the novelty, the inventive step, and the industrial applicability criteria set forth in the Patent Cooperation Treaty, the claims in the present application are believed to conform with both U.S. formal and substantive requirements, and they are therefore believed to be in allowable form. Accordingly, an early Notice of Allowance is in order and is respectfully solicited.

Should the examiner have any question after considering this amendment, he is cordially invited to telephone the undersigned attorney in order that any such question can be

quickly resolved, so that the present application can proceed toward allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Alfred J. Mangels', with a long horizontal flourish extending to the right.

May 9, 2000

Alfred J. Mangels
Reg. No. 22,605
4729 Cornell Road
Cincinnati, Ohio 45241
Telephone: (513) 469-0470

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526 Rec'd PCT/PTO 09 MAY 2000

A METHOD AND ARRANGEMENT FOR WIRELESS DATA TRANSMISSION

5 The present invention relates to a method and to an arrangement for wireless, data transmission. More specifically, the invention relates to the transmission of data by digital broadcasting transmissions.

10 The present invention relates primarily to a method and to an arrangement for transmitting data from one computer to one or more other computers with the aid of a radio transmitter and one or more receivers, so as to enable data to be transmitted in applications using equipment produced in accordance with the international standard DAB (Digital Audio Broadcast).

15 This standard DAB is described in prETS 300 401 radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers, February, 1997. The invention is not limited to this standard, however, but can be applied equally as well with digital radio transmissions
20 according to some other standard.

25 Frequencies are at present allotted to land-based DAB transmissions over the whole of Europe. The frequency spaces primarily used are TV channels in VHF band 111. Each DAB channel can transmit 2.304 Mbit/s gross, which corresponds, for instance, from five to six high-quality stereo programmes.

30 The modulation and signal processing technique chosen in accordance with the DAB standard is COFDM (Coded Orthogonal Frequency Division Multiplex), which enables all transmitters in a region-covering network to send the same signals on the

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same frequency without creating interference problems due to co-channel interference.

According to this standard, the entire bit stream in the DAB signal is transmitted in frames that have a typical duration of 96 ms. Each frame combines data from three channels, namely from the main service channel MSC, from the fast information channel FIC and from the synchronization channel.

The main service channel MSC may contain both service information, ISO/MPEG-coded audio signals and general data transmission in packet mode or stream mode. A so-called multiplex controller determines how the various information components shall be combined. This control information is sent separately in the fast information channel FIC. The mutual division between the information components can be controlled dynamically in accordance with requirements. The information channel FIC also discloses how data in the main service channel shall be interpreted at each moment in time.

The entire main service channel MSC can be used, in principle, for data transmission, giving a net bit rate of 1.2 to 1.5 Mbit/s.

The DAB standard is primarily intended to enable six to seven high-quality stereo radio programmes to be transmitted in each DAB channel of about 2 Mhz, although the distribution of the content of a DAB channel, called an ensemble, can be allocated dynamically and used for purposes other than the transmission of digitalized and compressed sound channels. The standard also provides space for the transmission of data in greater or smaller parts of a DAB channel, either with a

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limited transmission requirement in the form of packet switched data quantities in a simpler case, or for the highest data rate of up to 2 Mbit/s when the entire ensemble is disposed for data transmission in a stream mode.

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According to the foregoing, the DAB system should be capable of transmitting digital data from one computer to one or more other computers, at a rate of up to 1.5 Mbit/s.

10 One serious problem in this regard, however, is that a computer is not designed to receive a more or less continuous DAB data stream, since a computer that typically includes the standardized PCI bus is designed to perform PCI bus transactions in the form of bursts.

15

The present invention solves this problem and enables data to be transferred between computers with the aid of the DAB system.

20 Many computers are, at present, connected to cable networks or tele-networks for the exchange of information between different computers. When several computers shall receive certain information from one computer, this latter computer must be connected to each of the other computers in an
25 ordered sequence. This is both time-consuming and expensive.

The cost of transmitting ether-carried information with the aid of the present invention can be drastically reduced while many receivers can be reached simultaneously.

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An example of one application is found in the transmission of price information from a wholesaler in the daily commerce to

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all stores, shops, etc., that belong to the wholesaler. The use of ether-bound information transmission would enable all price information to be sent to all stores at one and the same time and also very quickly. Another obvious application is found in the distribution of news and advertisements, i.e. principally in a newspaper.

Another important advantage would be afforded if a receiver need not be stationary but can be mobile. One example in this respect is found in rescue services and police services, to particular benefit. Information concerning a rescue service, emergency service, or a police service could be sent to mobile units, i.e. to rescue vehicles and police cars. Such transmission would facilitate the co-ordination of personnel, etc., in rescue operations and police operations of comprehensive magnitude, by virtue of all parties concerned receiving updated information simultaneously.

However, the present invention is not limited to any particular application, but can be used in any context where information shall be transmitted between computers.

The present invention thus relates to a method for the wireless transmission of data between one computer and one or more other computers with the aid of the DAB system or a corresponding system for the digital, wireless transmission of data, wherein the transmitting computer is connected to a DAB transmitter, wherein the receiving computer or the receiving computers is/are connected to a respective DAB receiver, and wherein the method is characterized in that information outputted intermittently from the transmitting computer is stored intermediately in a memory in a first

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adaptation circuit, between the transmitting computer and the DAB transmitter, in that information is fed from said memory to the DAB transmitter essentially continuously under the control of an outfeed oscillator in the adaptation circuit, in that transmitted information is received by a DAB receiver and fed into a memory in a second adaptation circuit under the control of an input oscillator in said second adaptation circuit, in that the two oscillators operate on the same or essentially the same frequency, and in that the receiving computer is caused to take information intermittently from the memory store in the second adaptation circuit.

The invention also relates to an arrangement that has the main features defined in Claim 5.

The present invention will now be described in more detail with reference to exemplifying embodiments thereof and also with reference to the accompany drawing, in which Figure 1 is a block schematic illustrating a transmitter side and a receiver side.

Shown in the Figure is an arrangement for the wireless transmission of data between a computer 1 and one or more other computers 2 with the aid of the DAB system or a corresponding system for the wireless transmission of digital data. Such a corresponding system may be a system for digital TV transmissions. The transmitting computer 1 is connected to a known DAB transmitter 3 that has a transmitter antenna 5. The receiving computer or computers 2 is/are connected to a respective known DAB receiver 4 that has a receiver antenna 6.

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The inventive arrangement includes a first adaptation circuit 7 between the transmitting computer 1 and the DAB transmitter 3. The adaptation circuit 7 is adapted for the intermediate storage of information outputted intermittently from the transmitting computer 1 in a memory 8 belonging to said adaptation circuit. The memory may be a RAM memory or a FIFO memory. The adaptation circuit is also adapted to take information from the memory 8 and feed this information to the DAB transmitter 3 generally continuously under the control of an outfeed oscillator 9 in the adaptation circuit 7. The oscillator 9 controls the outfeed of information from the memory 8 to the DAB transmitter 3, via an outfeed circuit 10 of some suitable known kind.

A second adaptation circuit 11 is provided between respective DAB receivers 4 and receiving computers 2. This second adaptation circuit 11 is adapted to feed information received by the DAB receiver 4 into a memory store 12 in the second adaptation circuit under the control of an infeed oscillator 13 in said second adaptation circuit. The oscillator 13 controls the infeed of information from the DAB receiver 4 to the memory 12, via an infeed circuit 14 of some suitable known kind. The memory 12 may be a RAM memory or a FIFO memory.

The two oscillators 9, 13 are adapted to operate at mutually the same frequency, or at essentially the same frequency, in accordance with the DAB standard.

The receiving computer 2 is adapted to fetch information intermittently from the memory 12 in the second adaptation circuit.

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5 In one preferred embodiment, the oscillator 13 in the second adaptation circuit 11 is adapted to be synchronized with the oscillator 9 in the first adaptation circuit, by locking the frequency of the second oscillator 13 to a reference included in the received signal. This can be achieved by including in the second adaptation circuit 11 a microprocessor 15 that functions to detect the signal received by the DAB receiver and to decode a predetermined part of said received signal that constitutes said reference and therewith activate the oscillator 13.

10

15 In one preferred embodiment, the microprocessor 15 is adapted to determine from a FIC (Fast Information Channel) in the DAB system those parts of the received signal that contain data. The microprocessor is also adapted to store received data in the memory 12 of said adaptation circuit.

20 In one embodiment, the microprocessor 15 includes software that causes the received information to be structured and stored in the memory 12 in a form that enables a standard PC 2 to fetch information from the memory 12. Alternatively, the software can be installed in the personal computer, PC.

25 In one highly preferred embodiment, the microprocessor 15 in the second adaptation circuit 11 is adapted to identify information that is relevant to the receiving computer 2 and that includes identification of address information and possibly also authorization.

30 It is thus possible to address one or more of all computers that are connected to a DAB receiver 4.

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This enables, for instance, a convenience goods wholesaler or dealer who sends information relating to prices of goods found in shops or stores throughout the country concerned to chose to send price information to stores in different parts of the country, when the prices of goods vary in different parts of the country at mutually different times.

The possibility of detecting authorization is achieved by programming the microprocessor so that it will only feed received information into the memory 12 when the information received includes an authorization code. This authorization can be given, for instance, by providing a subscriber that has a DAB receiver with a smart card that is read by a card reader 16 connected to the microprocessor 15 and containing said authorization code. The microprocessor is, in this regard, adapted to compare an authorization code received by the DAB receiver with the authorization code entered by means of the smart card. This embodiment can be used, for instance, when the information transmitted includes various types of news. Only subscribers that have paid for their subscription and therewith obtained a smart card which includes a valid authorization code can receive the transmitted information.

Thus, the information to be transmitted is stored intermediately in the memory of the first adaptation circuit. The information to be transmitted is sent via the DAB system in a more or less continuous form, whereas information is delivered intermittently from the transmitting computer 1, as before mentioned. Thus, the information is outputted to the DAB transmitter from said memory 8 essentially continuously and under the control of the outfeed oscillator 9. Transmitted information is thus received by the DAB receiver

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in an essentially continuous form, and is fed into the memory in the second adaptation circuit 11 under the control of the infeed oscillator 13. The receiving computer is then caused to fetch information intermittently from the memory in the second adaptation circuit.

The present invention thus enables information to be transmitted via the DAB system, or some corresponding system for the wireless transmission of data, at high speed and in a more or less continuous form between standard computers, such as typical personal computers, PCs, which are not constructed to output and input data essentially continuously but, instead, constructed to output and input information in bursts.

The present invention thus solves the problem mentioned in the introduction.

Adaptation circuits 7, 11 have been described in the foregoing. These circuits may be physically separate units or may comprise an electronic card that can be mounted in a PC or some other computer. Naturally, the invention does not solely apply to personal computers and can be applied to all types of computers.

The adaptation circuit may, of course, be constructed in many different ways for achieving the aforescribed function. It will be obvious to the person skilled in this art that the structural design of the adaptation circuits can vary.

The present invention is thus not limited to the aforescribed exemplifying embodiments thereof since

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CLAIMS

1. A method for the wireless transmission of data between one computer and one or more other computers with the aid of the DAB system or a corresponding system for the wireless transmission of digital data, where the transmitting computer is connected to a DAB transmitter and where the receiving computer or computers is/are connected to a respective DAB receiver, characterized in that information that is outputted intermittently from the transmitting computer (1) is stored intermediately in a memory (8) of a first adaptation circuit (7) between the transmitting computer (1) and the DAB transmitter (3); in that information is outputted essentially continuously from said memory (8) to said DAB transmitter (3) under the control of an outfeed oscillator (9) in the adaptation circuit; in that transmitted information is received by a DAB receiver (4) and fed into a memory (12) in a second adaptation circuit (11) under the control of an infeed oscillator (13) in the second adaptation circuit (11); in that the two oscillators (9, 13) operate on mutually the same frequency or essentially the same frequency; and in that the receiving computer (2) is caused to fetch information intermittently from the memory (12) in the second adaptation circuit (11).

2. A method according to Claim 1, characterized in that the oscillator (13) in the second adaptation circuit (11) is caused to be synchronized with the oscillator (9) in the first adaptation circuit (7), by locking the frequency of the second oscillator (13) onto a reference included in the received signal.

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3. A method according to Claim 1 or 2, characterized in that the second adaptation circuit (11) includes a microprocessor (15) which is caused to determine from a fast information channel (FIC) in the DAB system those parts of the received signal that contain data, and to cause the received data to be stored in the memory (12) of the second adaptation circuit (11).

4. A method according to Claim 3, characterized in that the microprocessor (15) of the second adaptation circuit (11) is caused to identify information that is relevant to a receiving computer (2) and that includes identification of address information and possibly also authorization.

5. An arrangement for the wireless transmission of data between a computer and one or more other computers with the aid of the DAB system or some corresponding system for the wireless digital transmission of data, where the transmitting computer is connected to a DAB transmitter and where the receiving computer or computers is/are connected to a respective DAB receiver, characterized by a first adaptation circuit (7) between a transmitting computer (1) and the DAB transmitter (3), said circuit being adapted to store information delivered intermittently from the transmitting computer (1) intermediately in a memory (8) that belongs to said first adaptation circuit (7); in that the adaptation circuit (7) is adapted to output the information from said memory (8) to said DAB transmitter (3) essentially continuously under the control of an outfeed oscillator (9) in the adaptation circuit (7); in that the arrangement includes a second adaptation circuit (11) between DAB receiver (4) and receiving computer (2) respectively, said

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second adaptation circuit (11) being adapted to input information received by the DAB receiver (4) into a memory (12) in the second adaptation circuit (11) under the control of an infeed oscillator (13) in said second adaptation circuit (11); in that the two oscillators (9, 13) operate at the same or essentially the same frequency; and in that the receiving computer (2) is adapted to fetch information intermittently from the memory (12) in the second adaptation circuit (11).

10

6. An arrangement according to Claim 5, characterized in that the oscillator (13) in the second adaptation circuit (11) is intended to be synchronized with the oscillator (9) in the first adaptation circuit (7), by locking the frequency of the second oscillator (13) to a reference included in the received signal.

15

7. An arrangement according to Claim 5 or 6, characterized in that the second adaptation circuit (11) includes a microprocessor (15) which is adapted to decide from a fast information channel (FIC) in the DAB system which parts of the received signal contain data, and to store received data in the memory (12) of the second adaptation circuit (11).

20

8. An arrangement according to Claim 7, characterized in that the microprocessor (15) in the second adaptation circuit (11) is adapted to identify information that is relevant to receiving computer (2) and that includes identification of address information and possibly also authorization.

25

Abstract of the Disclosure

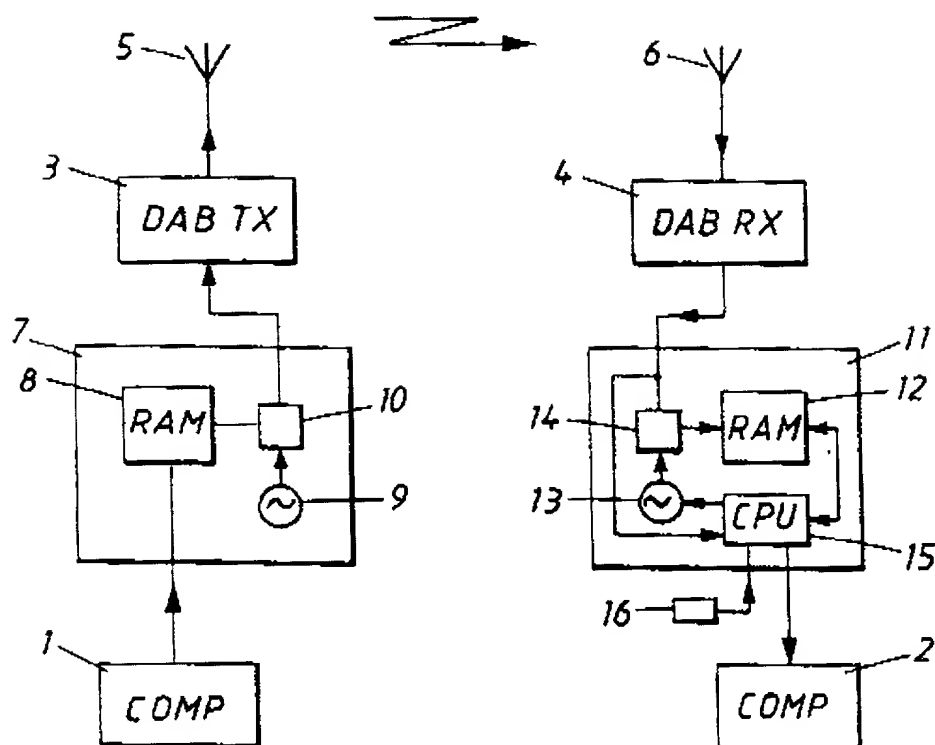
A method and apparatus for the wireless transmission of data between one computer and one or more other computers with the aid of the DAB system or a
5 corresponding system for the wireless transmission of digital data. The transmitting computer is connected to a DAB transmitter and the receiving computer is connected to a respective DAB receiver. Information that is outputted intermittently from the transmitting computer is stored intermediately in a memory of a first adaptation circuit between the transmitting computer and the DAB transmitter. The information is outputted essentially
10 continuously from the transmitter memory to the DAB transmitter under the control of an outfeed oscillator in the adaptation circuit. The transmitted information is received by a DAB receiver and fed into a memory provided in a second adaptation circuit under the control of an infeed oscillator in the second adaptation circuit. The two oscillators operate on substantially the same frequency, and the receiving computer is caused to fetch
15 information intermittently from the memory in the second adaptation circuit.

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Fig. 1



DECLARATION AND POWER OF ATTORNEY

ATTORNEY'S DOCKET NO.
1314

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled A method and arrangement for wireless data transmission
the specification of which

(check)
one)☒ is attached hereto.
☐ was filed on _____ as

Application Serial No. _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a), and Title 35 USC §102, as printed on the reverse of this Declaration and which I have read.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

9704101-6

(Number)

Sweden

(Country)

10 November 1997

(Day/Month/Year Filed)

Priority Claimed

☒ Yes☐ No

(Number)

(Country)

(Day/Month/Year Filed)

☐ Yes☐ No

(Number)

(Country)

(Day/Month/Year Filed)

☐ Yes☐ No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status — patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status — patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint

Alfred J. Mangels, Registration No. 22,605, my attorney with

full power of substitution and revocation to prosecute this application, to receive correspondence from and transact all business in the Patent Office connected therewith. The correspondence address of the above attorney is

SEND CORRESPONDENCE TO: Alfred J. Mangels4729 Cornell RoadCincinnati, Ohio 45241-2433

DIRECT TELEPHONE CALLS TO:

(513) 469-0470

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor

Gunnar Wahlsten

Inventor's signature

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